Diabetes Among Racial and Ethnic Minorities in Nebraska 1992-2001

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ADA/AA/EOE

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DEFINITION OF TERMS

Age-Adjusted Rate: A weighted average of a crude death rate according to a standard distribution. Age adjusting is a process by which the age composition of a population is held constant so that changes or differences in age composition can be eliminated from the analysis. This is necessary because older populations have higher death rates merely because death rates increase with age. Age adjusting allows the researcher to make meaningful comparisons over time and among groups in the risk of mortality. The death rates in this report have been adjusted according to the age distribution of the United States population in 2000. [1]

Body Mass Index (BMI): A measure of weight relative to height. A BMI of less than 25 is considered ideal or healthy; a BMI of 25-29 is considered overweight; and a BMI greater than 30 is considered to be indicative of obesity. BMI is calculated by dividing an individual's weight in kilograms by the individual's height in meters squared.[2]

BRFSS: The Nebraska Behavioral Risk Factor Surveillance Survey, adapted from the National BRFSS.

CDC: Centers for Disease Control and Prevention, based in Atlanta, GA.

Death Rate: A death rate is a ratio between mortality and population; the number of deaths per specific number of people. This is the most widely used measure to determine the overall health of a community. Death rates are usually computed per 100,000 population.[3] Rates allow meaningful comparisons between groups of unequal size.

Diabetes, often times called *diabetes mellitus,* is a disease of the pancreas in which the body does not produce or properly use insulin, a hormone that is needed to convert glucose into energy.[4] According to the Centers for Disease Prevention and Control (CDC), "Diabetes mellitus is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications."[8]

Hypertension/High Blood Pressure: A systolic reading of 140mm Hg or higher over a diastolic reading of 90mm Hg and higher is an indication of hypertension or high blood pressure. [1]

ICD-10: International Classification of Diseases, 10th Revision, 1999.

Incidence: Incidence is an estimate of the number of new cases of disease that develop in a population in a specified time period, usually one year. Incidence is often used as an indicator of the need for preventive measures, or to evaluate the effectiveness of existing programs.[5]

Medicaid: A state and federal program which funds and provides specific and approved health care and related services for individuals meeting certain eligibility conditions.

MBRFS: Minority Behavior Risk Factor Survey, adapted from the Nebraska BRFSS.

Morbidity: A term used to describe disease, sickness or illness, as a departure from normal physiological and psychological conditions. It is normally expressed as a morbidity rate. Morbidity rates give the closest frame of the quality of life and health status in a given population. [5]

Mortality: A term used to describe death. It is normally expressed as a rate, expressing the proportion of a particular population who die of one or more diseases or of all causes during a specified unit of time, usually a year. It is also the probability of dying within a specified time period. This rate is also called the "crude death rate." [5]

Prevalence: Prevalence is an estimate of how many people have a specific condition or disease at a given point in time. This number is useful in assessing the level of medical and social care needed for current cases. [5]

Relative Risk: Relative risks of disease or death were calculated using the following formula:

$$\text{Relative Risk} = \frac{\text{Mortality (or Incidence) Rate of Minority Population}}{\text{Mortality (or Incidence) Rate of White Population}}$$

A value of 1.0 indicates that the racial/ethnic minority population has a risk of acquiring or dying from certain specific disease equal to that of the white population. A relative risk of less than 1.0 means that the minority population is less likely than the white population to die of, or develop a certain type of disease. If the relative risk is greater than 1.0, the minority population suffers proportionally more illness or deaths from this condition than the white population.

Surveillance: The ongoing scrutiny of a condition or characteristic, generally using methods distinguished by their practicability, uniformity, and frequently their rapidity, rather than by complete accuracy. Its main purpose is to detect changes in trends or distribution to initiate investigative or control measures.[1]

YPLL: Years of Potential Life Lost to a disease, condition or cause. This is an indicator of premature death. It is calculated using 75 years of potential life as the basis. For instance, infants who die at 6 months have lost 74.5 years of potential life. An adult who dies at the age of 50 years has lost 25 years of life.[2]

Executive Summary

This report provides relevant health data on the impact of diabetes on Nebraska's racial and ethnic minorities for policy makers, health care professionals, the public health community, and the general public. The data is used by the Office of Minority Health in the Nebraska Health and Human Services System when identifying problem areas and recommending policy and intervention issues needed to address areas of concern.

This report describes data about diabetes among Nebraska's racial and ethnic minorities by comparing two five year periods, 1992-1996 and 1997-2001. Prevalence rates were analyzed and
mortality analysis was used to compare age-adjusted diabetes and diabetes related deaths for these two time periods for each racial and ethnic minority.

Overall, the result of this study shows that during the ten-year period 1992-2001 there were a total of 3,278 diabetes-underlying deaths and 12,475 diabetes-related deaths. Diabetes age-adjusted rates increased for every racial and ethnic minority with the exception of Hispanics who experienced a slight decrease of 2.8 percent.

However, in the United States, in 1997-2001, diabetes ranked 6th, and in Nebraska 7th as the leading cause of death. An estimated 80,439 Nebraskans, or 6.4 percent of the 2001 population self-reported that they have been diagnosed with diabetes.

During 1997-2001, among Nebraskans 18 years and older, the diabetes prevalence rate for African Americans (9.9 percent) and Native Americans (9.4 percent) was higher than the rates for other ethnic minorities, the general population of Nebraska, and the nation as a whole.

In 1997-2001, 46.5 percent of African American males ages 65-74 years, and 23.6 percent of Native American females ages 45-64, had the highest prevalence of diagnosed diabetes in Nebraska and the nation.

Diabetes disproportionately affects Nebraska racial and ethnic minorities especially those in the age category of 65-74 years of age and older. Thus the risk of diabetes and complication increases with age. In Nebraska, minority adults with diabetes are more likely to go for recommended checkups than whites are.

The results indicate that compared to whites in Nebraska, minorities have higher prevalence of the risk factors of diabetes. The prevalence of smoking, obesity, lack of physical activity, high blood pressure, high cholesterol level and lack of screening were higher among minorities, than among whites.

Fewer Hispanics with diabetes (62.3 percent) than all of Hispanics (67.8 percent) reported going for routine check in the past year (Figure 8). Furthermore, compared to Nebraska and other minorities, slightly over one-half (51.2 percent) of Hispanics with diabetes did not engage in any physical activity in the past year.

Only 45 percent of both Native and Hispanic Americans who have diabetes went for blood pressure checkup in the past year (Figure 9).

Approximately 21 percent of African Americans, 14.4 of percent Native Americans and 28.5 percent Hispanics who have diabetes had their cholesterol levels checked in the past year (Figure 10).

While 17.2 percent of adult Nebraskans with diabetes currently smoke cigarettes, almost two-thirds of Native Americans (60.5 percent) with diabetes are smokers (Figure 11).

Over three-fourths of adult Hispanics (82.2 percent) who have diabetes, are obese (Figure 14), while 51.2 percent do not engage in any physical activity (Figure 13). However, 37 percent of Native Americans with diabetes do not have any health insurance (Figure 14).

Native Americans experienced an 87.1 and 45.6 percent increase and by far the highest rate of diabetes-underlying (118.4) and diabetes-related deaths (322.8) of any racial or ethnic group in Nebraska when compared to the 1992-1996 rates of 63.3 and 221.4 per 100,000 population, respectively (Figure 15 and Tables 2 and 3). Native Americans are 4.7 times more likely than whites to die from diabetes-related causes.

African Americans (61.6) recorded the second highest diabetes-underlying age-adjusted cause mortality rates as well as for diabetes-related mortality rates (164.9) in the period 1997-2001, and are 2.4 times more likely than whites to die from diabetes related causes.

Although based on small sample size during 1997-2001, African Americans living in five of the six HHS (now changed to the new Western, Central and Eastern) service areas with the exception of Southwest service areas recorded diabetes-age adjusted mortality rates higher than whites and Nebraska as a whole. African Americans living in the Northern service area (672.5) are approximately 10 times more likely to die from diabetes-related deaths than whites (68.8) (Table 7).

Native Americans living in all the HHS service areas experienced higher mortality rates than Nebraska during the period 1997-2001. Native Americans (459.1) in the Northern service area are approximately 7 times more likely than whites (68.8) to die from diabetes-related deaths. Asian Americans in the Eastern, Western, and Southeast and Hispanics in the Northern, Western, and Southeast service areas had higher diabetes-related mortality rates than whites and the Nebraska general population (71.8) (Table 7).

During 1997-2001 minorities in Nebraska lost from diabetes, a total of 2,802 years of potential life. Native Americans (919.0), both females (1,006.0), and males (787.6) and overall African Americans (379.9) and males (445.0) recorded the highest age-adjusted diabetes Years of Potential Life Lost (YPLL) rates per 100,000 population (Table 9).

Introduction

Purpose

This report provides relevant health data on the impact of diabetes on Nebraska's racial and ethnic minorities for policy makers, health care professionals, the public health community, and the general public. The data is used by the Office of Minority Health in the Nebraska Health and Human Services System when identifying problem areas and recommending policy and intervention issues needed to address areas of concern.

"The goal of the Nebraska Diabetes Control and Prevention Program is to reduce diabetes-related disability and death in Nebraska, and to improve the quality of life and medical care for Nebraskans who have diabetes."[4] Since 1995 the Program has been producing reports to provide current data that describes the impact of diabetes and diabetic health features and characteristics of Nebraska's general population. As a result of limited access to racial and ethnic minority populations and the inherent small sample size, the data in these reports have not been adequate to assess and determine the full impact of diabetes among racial and ethnic minorities in Nebraska.

This report is a tool to obtain a better understanding of diabetes among Nebraska's racial and ethnic minority population. Given the small data sample size of minorities a study of unique and related health issues provides a better and larger scope of understanding of the associated health disparities in order to develop specific strategic interventions.

This report describes data about diabetes among Nebraska's racial and ethnic minorities by comparing two five year periods, 1992-1996 and 1997-2001. Mortality analysis was used to compare age-adjusted diabetes and diabetes related deaths for these two time periods for each racial and ethnic minority. Although there is not a diabetes registry in Nebraska, self-reported prevalence and risk factors from the Nebraska Behavioral Risk Factor Survey (BRFS) will be examined while analyzing prevalence rates, mortality, relative risk, and years of potential life lost, according to age, gender, race and ethnicity and health service areas of Nebraska. Relevant data from the Minority Behavior Risk Factor Survey (MBRFS) will be analyzed. The prevalence and mortality rates for gestational diabetes were not included in the general analysis; however the prevalence rates of gestational diabetes were analyzed separately and are shown in Figure 7.

Healthy People 2010 Objectives

"The national Healthy People 2010 goal for diabetes is to reduce the disease burden and economic costs of diabetes and improve the quality of life of all persons who have or are at risk for diabetes. The Healthy People 2010 objective # 5-5 is to reduce the diabetes death rate to no more than 45.0 per 100,000 population nationwide and to no more than 25.0 per 100,000 for Nebraska"[6] (Table 1).

Table 1

U.S. and Nebraska Healthy People 2010 Goals and Objectives						
	U.S. Data Year	U.S. Rate	U.S. 2010 Objective	Nebraska Data Year	Nebraska Rate	Nebraska 2010 Objectives
Diabetes age-adjusted Morality Rate/100,000 Population	1997	75	45.0	1998	70.3	25.0
White	1997	70	39.9	1994-1998	65.0	25.0
African American	1997	130	74.1	1994-1998	160.8	25.0
Native American	1997	107	61.0	1994-1998	261.9	25.0
Asian American	1997	62	35.3	1994-1998	27.2	25.0
Hispanic American	1997	86	49.0	1994-1998	92.2	25.0
Source: U.S. and Nebraska 2010 Health Goals and Objectives						

Types of Diabetes

Type 1 Diabetes or Insulin-Dependent Diabetes Mellitus (IDDM) occurs when the body produces little or no insulin, and typically affects children and young adults but can occur at any age.[9]

Type 2 Diabetes or Non-Insulin-Dependent Diabetes Mellitus (NIDDM), the most common form of diabetes, typically develops in adults and occurs when the body does not use insulin effectively. However, Type 2 diabetes has recently been diagnosed in children and adolescents. [9]

Gestational Diabetes, according to the CDC "is a form of glucose intolerance that is diagnosed in some women during pregnancy." Gestational diabetes is more common among African American, Hispanic and Native American women. It also occurs more frequently among obese women who have a family history of diabetes. Gestational diabetes is treated during pregnancy in order to stabilize the infant, thus avoiding complications. "After pregnancy, 5-10 percent of women with gestational diabetes are found to have Type 2 diabetes, and have a 20-50 percent chance of developing diabetes in the next 5-10 years," the CDC stated.[8]

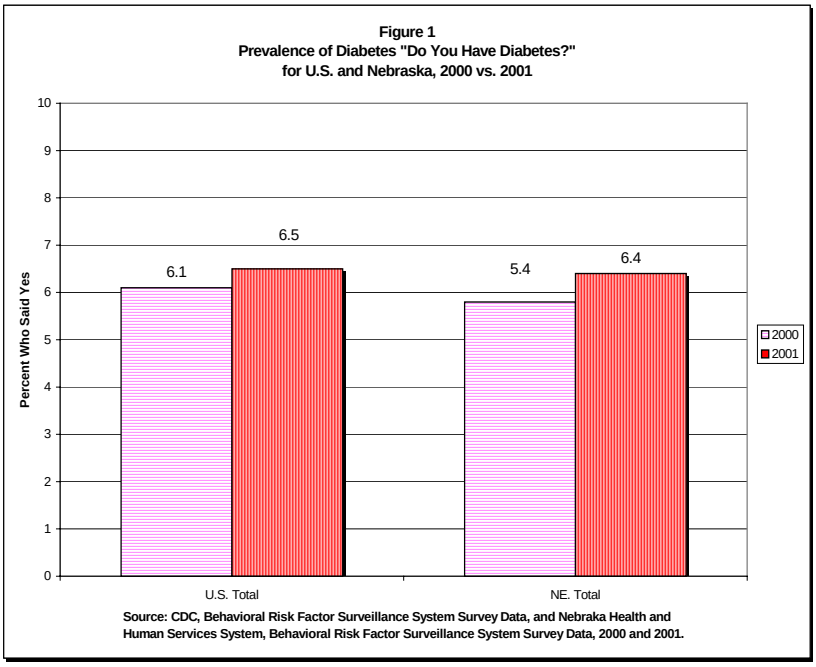
Prevalence

According to the CDC and the National Center for Health Statistics, the number of Americans with diabetes in 2000 was 17.0 million or 6.2 percent of the population, as compared to 15.7 million (5.9 percent) in 1998. This indicates an increase of approximately 8.3 percent in the prevalence of diabetes between 1998 and 2000. National estimates indicate that in 2000, 11.1 million people were diagnosed with diabetes while another 5.9 million people were undiagnosed.[9] The prevalence of diabetes among people under 20 years of age indicate that about 151,000 or 0.19 percent of the population have diabetes.[10]

Nationwide, among people aged 20 years and older, 16.9 million people or 8.6 percent of the population have diabetes. Furthermore, the largest increase in diabetes prevalence in the 1990s (76%) occurred among people aged 30-39, according to the American Association of Clinical Endocrinologists.[9]

Those 65 years and older who have diabetes number 7.0 million or 20.1 percent of all people; 7.8 million or 8.3 percent of all men have diabetes while 9.1 million or 8.9 percent of all women have diabetes. Note that "prevalence was calculated based on the total number of people with diabetes – both diagnosed and undiagnosed", according to the CDC and the National Health Interview Survey, 2000.[10]

The 2001 national BRFSS indicates that when asked the question "Have you ever been told by a doctor that you have diabetes," 6.5 percent of all respondents 18 years and older self-reported that they have diabetes, (excluding gestational diabetics) (Figure 1).[11]

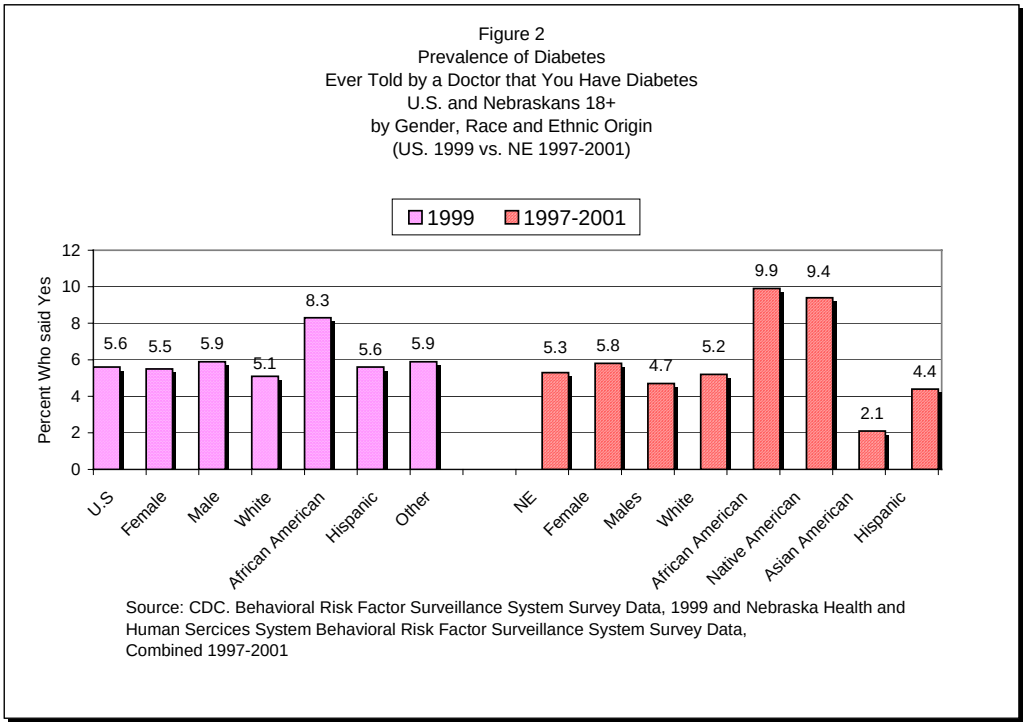


CDC reported that a greater prevalence of diabetes occurs among African Americans, Native Americans, and Hispanics than among whites. In 2000, the national BRFSS data indicate that 6.1 percent of the adult population were aware of, or have been told by a doctor that they have diabetes. Prevalence rates for diabetes in Nebraska were 5.4 and 6.4 percent for 2000 and 2001 respectively (Figure 1).[11]

In Nebraska, the 1997-2001 BRFSS indicated that 5.3 percent of adults 18 years and older (excludes gestational diabetics) stated that they have ever been told by a doctor that they have diabetes, (Figure 2). During 1997-2001 the prevalence rate of diagnosed diabetes decreased for both African Americans (9.9) and Hispanics (4.4) respectively from the previous five-year period 1992-1996 of 11.5 and 8.4.

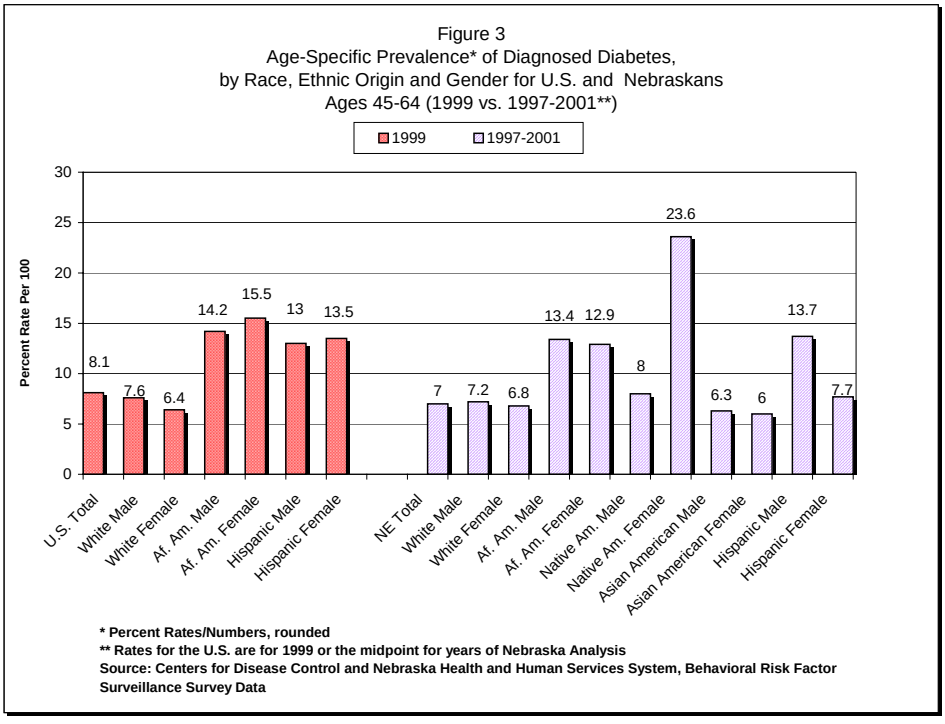
While African Americans (9.9 percent) and Native Americans (9.4 percent), were more likely to be diabetic, Hispanics (4.4 percent), were less likely than whites (5.2 percent) to indicate that they have been ever, informed by a doctor they have diabetes.[12]
Overall, Figure 2 seem to show that the prevalence rate of diabetes in Nebraska is fairly steady, while increasing in the rest of the nation.

In 2001, a total of 1,001 racial and ethnic minorities participated in the Lincoln Lincoln-Lancaster County 2001 Minority Behavior Risk Factor Survey (MBRFS). When asked: "Have you ever been told by a doctor that you have diabetes or high blood sugar?" 8.0 percent of the respondents interviewed, indicated they have been told by a doctor they have diabetes or high blood sugar.[13]



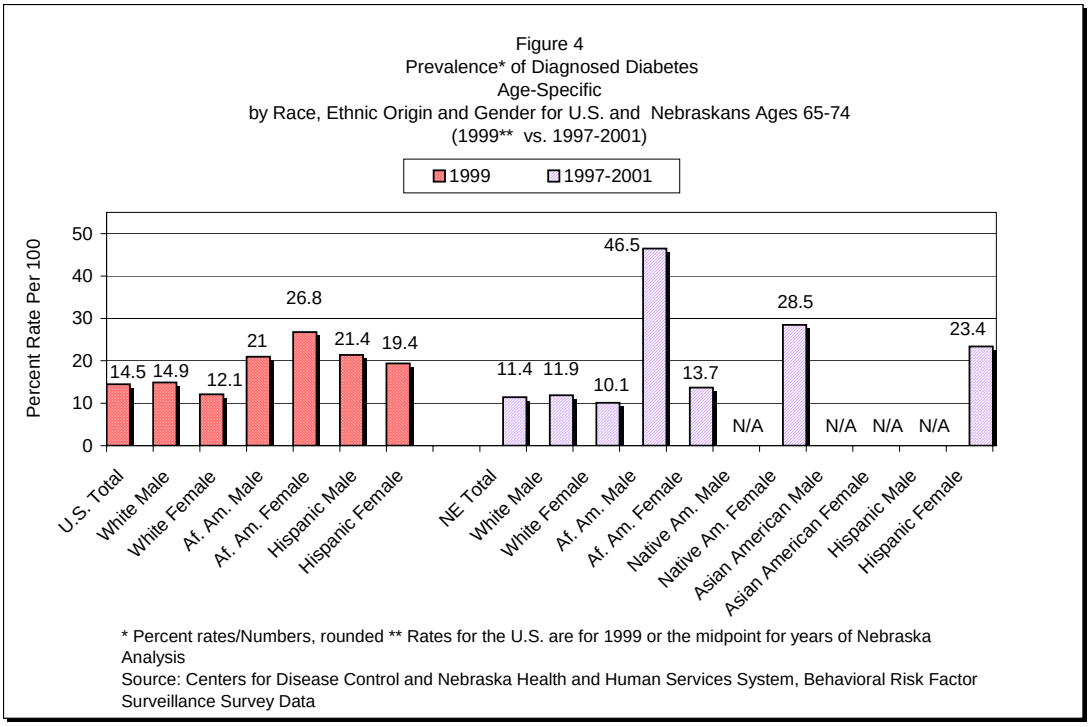
Prevalence by Age and Gender Specific

In 1997-2001, in the nation and Nebraska, among those in the 45-64 years of age, the prevalence of diagnosed diabetes was higher among Native American females (23.6), Hispanic males (13.7) and African American males (13.4) than whites in Nebraska. When compared to the nation in 1999, the prevalence of



diagnosed diabetes was also high for African Americans and Hispanics in this age group (Figure 3). Note: Some of these rates may have been based on small sample size.

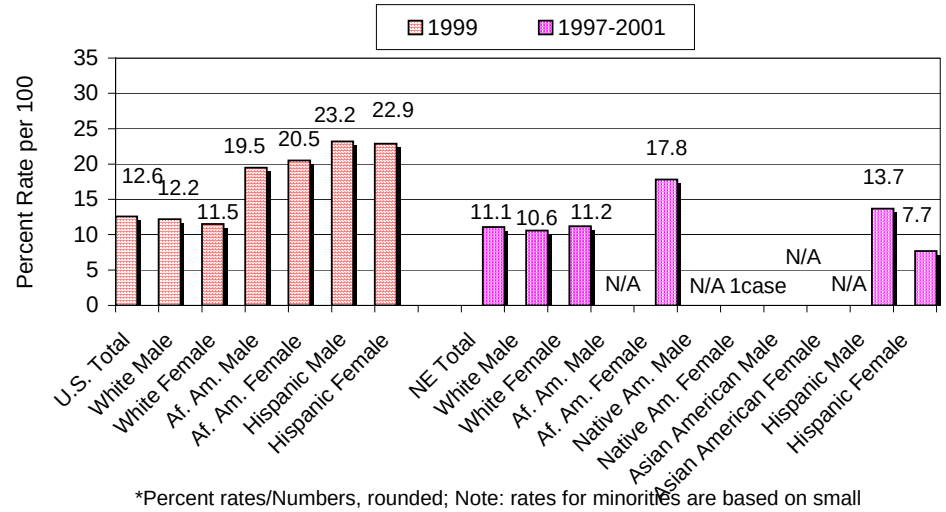
African American males (46.5), Native American Females (28.5) and Hispanic females (23.4) in the age category of 65-74 had the highest prevalence in Nebraska. Across the nation the rate was high for both African American males (21) and females (26.8) and Hispanic males (21.4) and females (19.4) in this age category (Figure 4).



* Percent rates/Numbers, rounded ** Rates for the U.S. are for 1999 or the midpoint for years of Nebraska Analysis
Source: Centers for Disease Control and Nebraska Health and Human Services System, Behavioral Risk Factor Surveillance Survey Data

Both minority genders in the age category of 75 years and older, at the national level seemed worse off than whites and their counterparts in Nebraska. In Nebraska, African American females (17.8 percent), Hispanic males (13.7 percent) and Females (7.7 percent) 75 years and older experienced higher rates of diagnosed diabetes during 1997-2001 (Figure 5).

Figure 5
Prevalence* of Diagnosed Diabetes
Age-Specific
by Race, Ethnic Origin and Gender
for U.S. and Nebraskans Age 75+ (1999** vs. 1997-2001)



*Percent rates/Numbers, rounded; Note: rates for minorities are based on small numbers

**Rates for the U.S. are for 1999 - midpoint year for Nebraska Analysis

Source: Centers for Disease Control and Nebraska Health and Human Services System, BRFSS Data

The incidence of diabetes is high among Nebraska minorities in the age category of 65-74 years of age. Data generated from this study indicates that when three separate age categories are compared to one another, African Americans (32.3 percent), Native Americans (21.7 percent), and Hispanics (13.4 percent) in the age bracket 64-74 years of ages have higher rates of diabetes prevalence than their white counterparts (10.9 percent), (Figure 6). For Asian Americans, data was available only for the 45-64 years of age category and 6.2 percent of these self-reported they have diabetes.

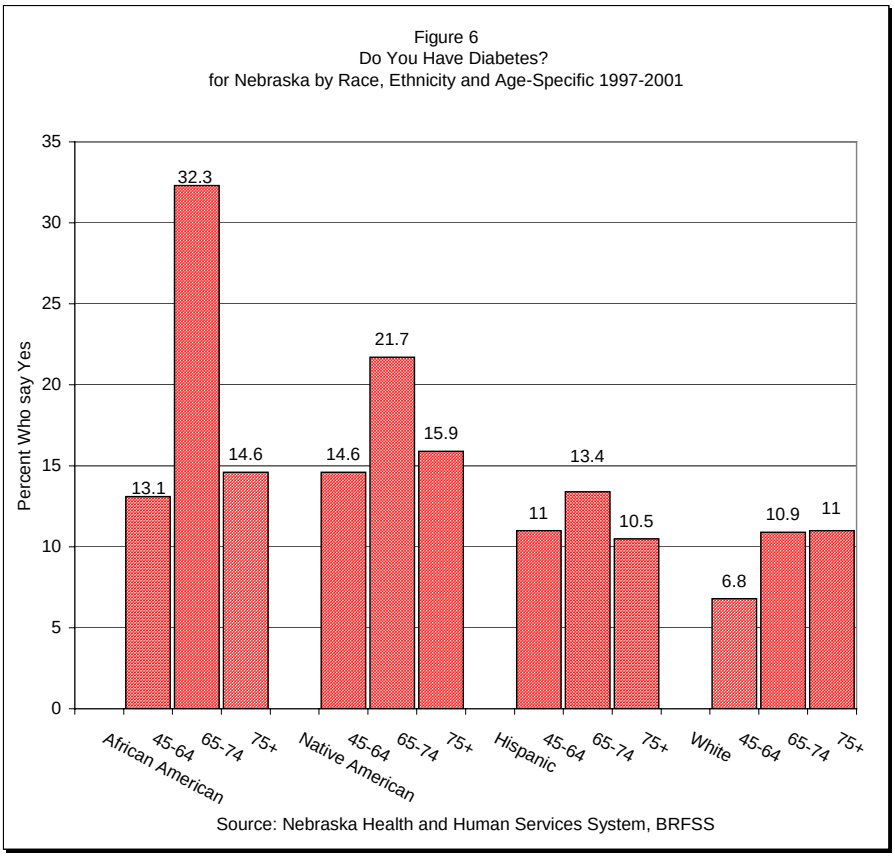
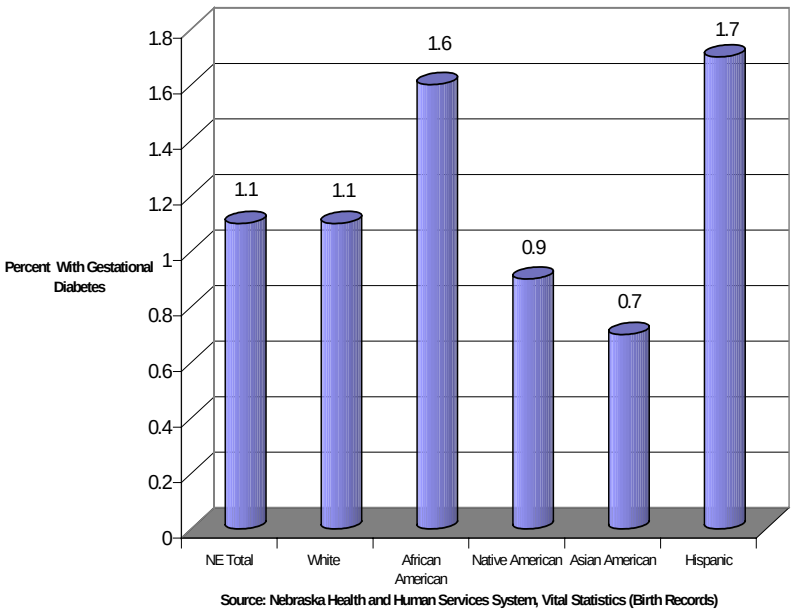


Figure 7 shows the percentage of gestational diabetes cases in Nebraska. Although based on small sample size, the prevalence of gestational diabetes among minorities is low. During 1997-2001, 1.7 percent Hispanic females and 1.6 percent African American females had gestational diabetes compared to 1.1 percent for whites.

Figure 7
Percent of Gestational Diabetes
for Nebraska Females by Race 1997-2001



Source: Nebraska Health and Human Services System, Vital Statistics (Birth Records)

In general, of the 8.0 percent of racial and ethnic minority respondents interviewed in the Lincoln-Lancaster County's 2001 MBRFS who indicated they have been told by a doctor they have diabetes or high blood sugar, 2.1 percent were females who were told during a pregnancy [13] (gestational diabetes). When compared with the state, the prevalence of gestational diabetes rate for Lincoln-Lancaster County shows similar low trend among minority females.

Why a Rise in Prevalence

According to the National Diabetes Education Program, the prevalence of diabetes is on the increase because of the rising number of older Americans and ethnic or minority American populations. Another reason is the increase in overweight individuals and sedentary lifestyles.[14]

U.S. Incidence of Diabetes

In 2001, over 800,000 new cases of diabetes were diagnosed or about 2,200 new cases each day, according to the American Association of Clinical Endocrinologists.[9] The majority of new cases are Type 2 diabetes and among people who are overweight and over 40 years of age, according to the National Diabetes Education Program.[14]

How does Nebraska compare with the U.S. on Prevalence of Diabetes?

In 2001, Nebraska's rate of 6.4 percent prevalence of diabetes per 100,000 population was slightly lower than the U.S. rate of 6.5 percent for 2001.

How are different racial and ethnic minority populations affected?

Diabetes is particularly common among African Americans, Native Americans and Hispanics.
When asked if they were ever told by a doctor that they have diabetes, 9.9 percent of African Americans and 9.4 percent of Native Americans, indicated yes during 1997-2001 (Figure 2).
Rates for Hispanics (4.4 percent) and Asian Americans (2.1) were lower than the general population rates. Nebraska's prevalence rate for diabetes of 5.3 percent was slightly lower than the U.S. rate of 5.6 percent (Figure 2).

Health Risk Factors

According to the American Association of Clinical Endocrinologists, risk factors for diabetes include age, obesity, family history, race and ethnicity, gestational diabetes, high cholesterol level, smoking and hypertension.[9] The Nebraska 2010 Health Goals and Objectives states that the risk of developing diabetes is higher for persons who are:

- Related to someone who has diabetes
- Over 45 years of age
- Overweight
- Mother of babies weighing over 9 pounds at birth or women who have had gestational diabetes

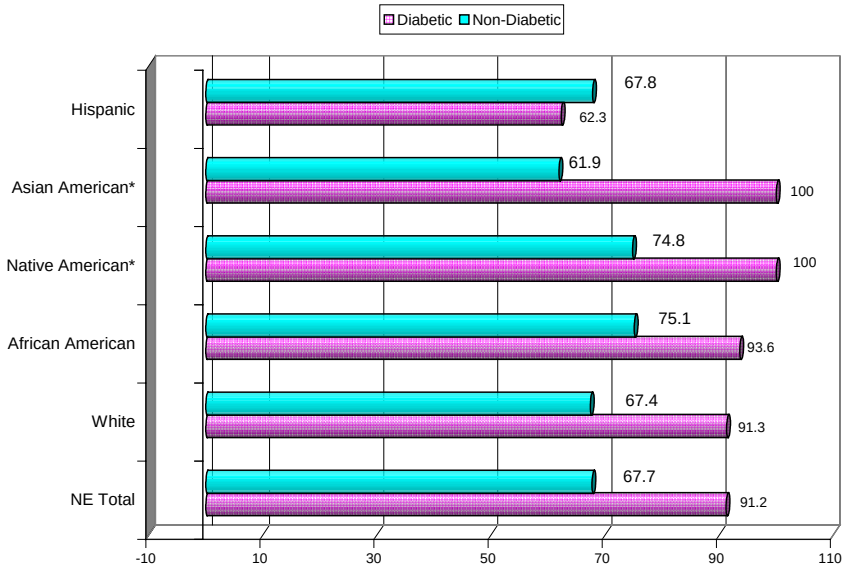
- Native American, African American, Hispanic American, Asian American, or Pacific Islander
- People who do not exercise regularly and people with low HDL cholesterol or higher triglycerides.[7]

Figure 8 indicates that the majority of Nebraskans with diabetes (91.2 percent) were more likely to go for a routine checkup than those with no diabetes (67.7 percent) in the past year. The trend is prevalent in racial and ethnic groups except for Hispanics, where in the past year about two-thirds with no diabetes (67.8 percent)- more than those with diabetes (62.3 percent), went for routine checkup. African Americans, both diabetic (93.6 percent) and non-diabetic (75.1 percent), were slightly more likely to go for checkup than whites (91.3 and 67.4 percent, respectively). Data for Asian and Native Americans were based on small numbers and so should be used with caution.

In Lincoln-Lancaster County, the results of its 2001 MBRFS indicated that with regards to the last time since the participants were seen for their diabetes, of the 1,001 racial and ethnic minorities interviewed, 76.9 percent had checked it within the past year; 3.1 percent within the past two years; 10.7 percent within the past three to five years, and 3.1 percent more than five years.[13]

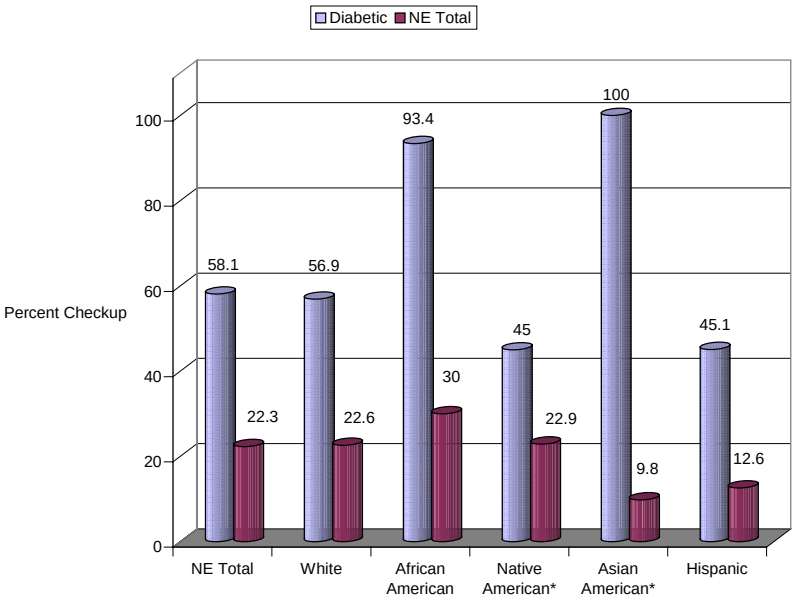
In Figure 9, more than one-half of adult Nebraskans with diabetes (58.1 percent) have had their blood pressure checked in the past year compared to 22.3 percent of Nebraska general population. Native Americans (45 percent) and Hispanics (45.1 percent) who have diabetes recorded the lowest rate for having their blood pressure checked in the past year.

Figure 8
Diabetes and Non-Diabetes Routine Checkup in Past 1 Year
for Nebraskans 18 + by Race and Ethnicity 1997-2001



Source: Nebraska Health and Human Services System, BRFSS

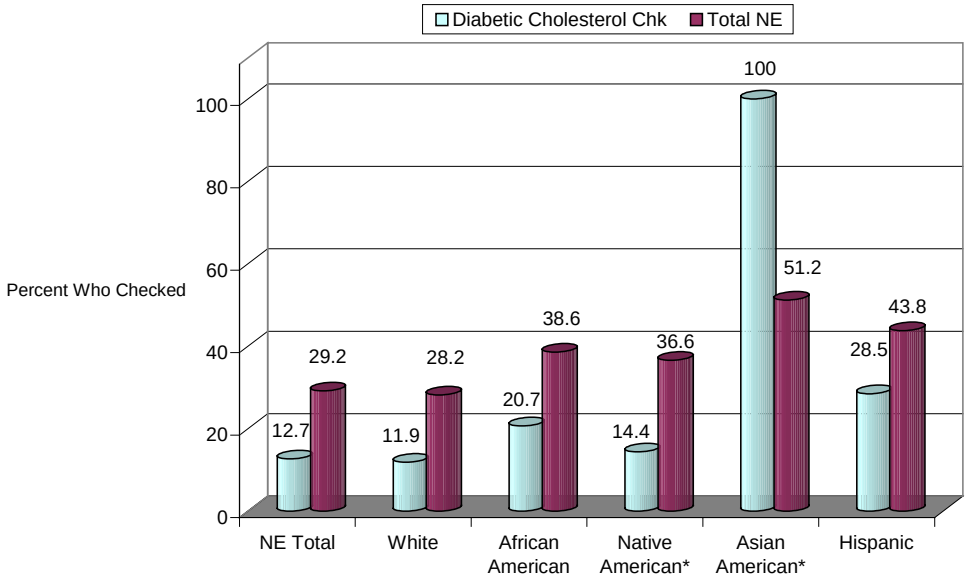
Figure 9
Blood Presure Checked in Past 1 Year
for Nebraskans 18 + by Diabetes, Race and Ethnicity 1997-2001



Percent based on small numbers
Source: Nebraska Health and Human Services System

In the past year, only 12.7 percent of Nebraska adults 18 years and older who have diabetes had their cholesterol levels checked. Results of this study show that among minorities, Hispanics (28.5 percent) and African Americans (20.7 percent) with diabetes appear to be more consistent than other groups, including Nebraska white about having their cholesterol levels checked. The percentage for Asian Americans is based on a very small number (Figure 10).

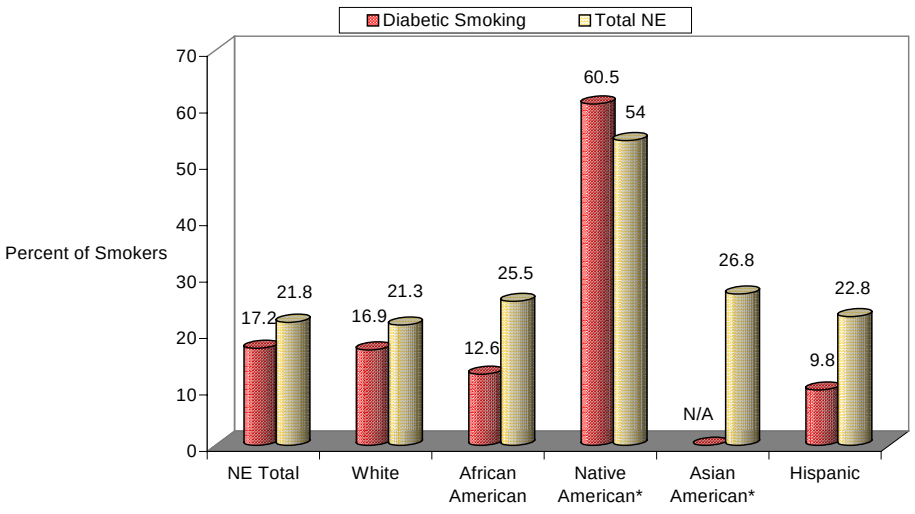
Figure 10
Cholesterol Level Checked in Past 1 Year
for Nebraskans Aged 18 + 1997-2001



Percent based on small numbers
Source: Nebraska Health and Human Services System, BRFSS

Smoking contributes to the risk of diabetes. While 17.2 percent of adult Nebraskans with diabetes currently smoke cigarettes, almost two-thirds of Native Americans (60.5 percent) with diabetes are smokers (Figure 11). Except for Native Americans, the overall prevalence of cigarette smoking is low among minorities with diabetes when compared to Nebraska rates.

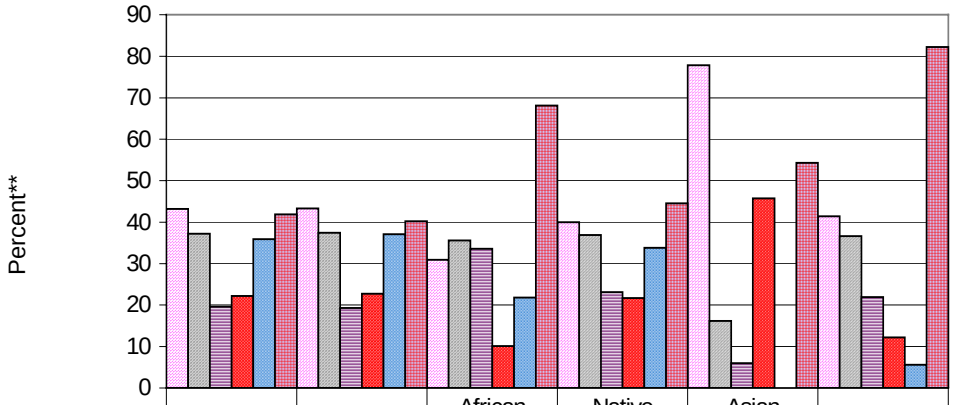
Figure 11
Prevalence of Cigarette Smoking
for Nebraaskans Age 18 +, 1997-2001



* Percent based on small numbers
Source: Nebraska Health and Human Services System, BRFSS

Obesity and being overweight contribute to the risk of diabetes. Close to one-fourth of Nebraska adults with diabetes (22.2 percent) are at an ideal weight while about one-third (35.9 percent) are overweight and almost 42 percent are obese, based on the Body Mass Index (BMI, where <25 = Ideal; 25-29 = Overweight, 30+ = Obese). When compared to Nebraska rates, most of racial and ethnic minority adults who are diabetic are either obese or overweight. Over three-fourths of adult Hispanics (82.2 percent) who have diabetes are obese (Figure 12).

Figure 12
Prevalence of Ideal, Overweight and Obesity*
Among Nebraskans Ages 18+, (1997-2001)

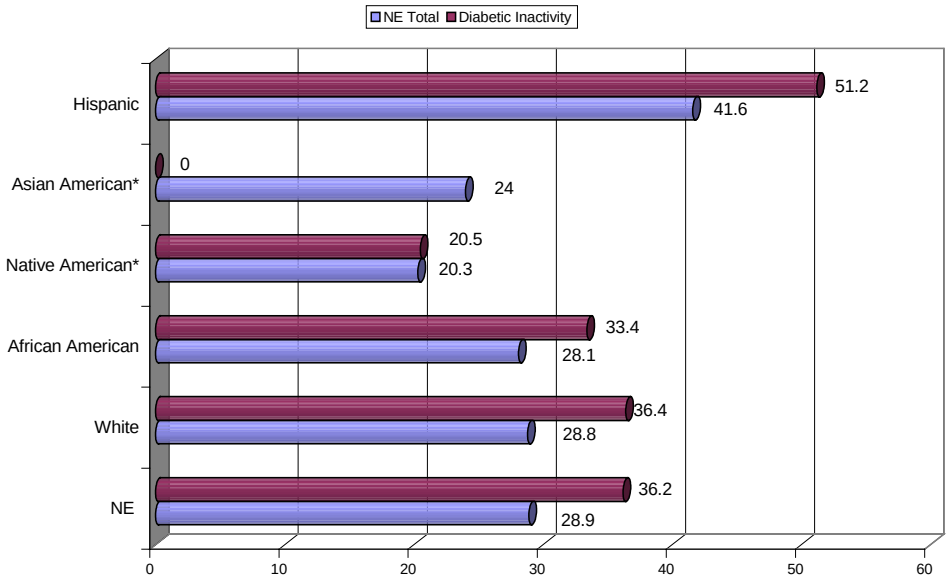


	NE Total	White	African American	Native American**	Asian American**	Hispanic
Ideal weight	43.2	43.3	30.9	40	77.8	41.4
Over weight	37.2	37.4	35.6	36.9	16.2	36.6
Obeseity	19.6	19.3	33.6	23.1	6	21.9
Diab-Ideal weight	22.2	22.7	10.1	21.7	45.74	12.2
Diab-Over weight	35.9	37.1	21.8	33.8	0	5.6
Diab- Obesity	41.9	40.2	68.1	44.5	54.3	82.2

* Based on Body Mass Index **Percent Rates based on small numbers
Source: Nedbraska Health and Human Services System, BRFSS

Slightly more than half (51.2 percent) of Hispanics and one-third of African Americans (33.4 percent) who have diabetes reported they have not participated in any leisure-time physical activity in the past 5 years when compared to Nebraska as a whole (36.2 percent) (Figure13).

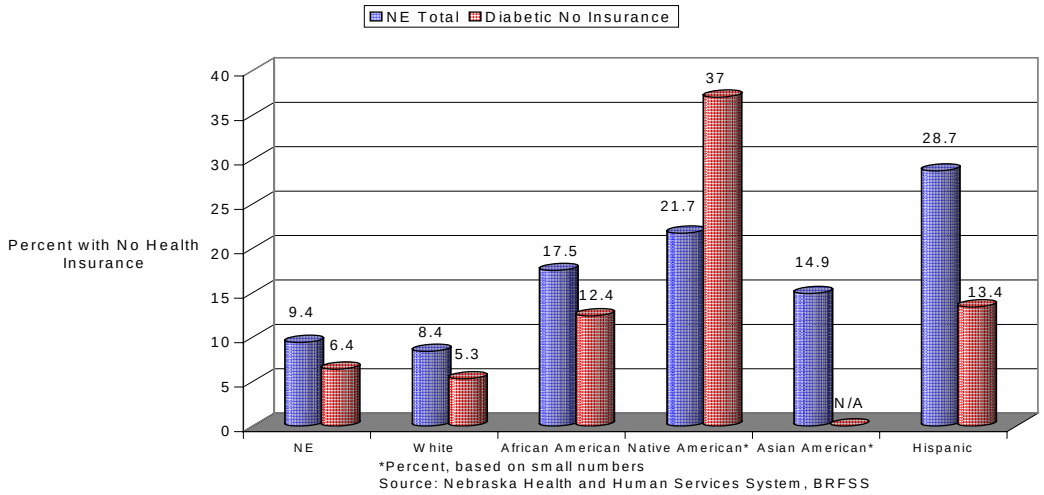
Figure 13
No-Leisure -Time Physical Activity
Among Nebraskans 18 + , 1997-2001 Combined



* Percent based on small numbers
Source: Nebraska Health and Human Services System, BRFSS

Thirty-seven percent of Native Americans with diabetes do not have any health insurance. In comparison, 13.4 percent of Hispanics and 12.4 percent of African Americans with diabetes do not have insurance coverages. When compared to the state, only 6.4 percent of Nebraskans with diabetes, and 5.3 percent of whites who have diabetes do not have any health insurance (Figure 14).

Figure 14
Percent* of Nebraskans with No Health Insurance
Adults Aged 18 + (1997-2001)



*Percent, based on small numbers
Source: Nebraska Health and Human Services System, BRFSS

Complications

If untreated, diabetes can contribute to serious complications such as blindness, kidney failure, and non-traumatic lower limb amputations.[14]
Further complications may include heart disease, stroke, and heart attack, diabetes and its complications are estimated to cost the nation over $100 billion dollars yearly.[9]

Mortality and Mortality Rates

Deaths with Diabetes as Underlying Cause

Nationally, the diabetes-underlying cause of deaths rate (all deaths listed on the death certificate with diabetes diagnosed as the primary cause of death) increased to 25.2 deaths per 100,000 in 2000 compared to the 1994 rate of 22.7 per 100,000 population.

In Nebraska, during 1997-2001, there was a total of 3,278 diabetes-underlying cause of deaths; the rates increased to 20.1 deaths per 100,000 population, compared to 16.5 deaths per 100,000 population in 1992-1996. Furthermore, Nebraska experienced a total of 12,475 diabetes-related deaths (all deaths listed on the death certificate having an underlying cause and showing diabetes as a contributing factor) in the 10-year period 1992-2001.

Although based on small sample numbers, Native Americans experienced an 87.1 percent increase and by far the highest rate of diabetes-underlying cause (118.4) of any racial group in Nebraska when compared to the 1992-1996 rate of 63.3 deaths per 100,000 population (Table 2).

Trends in Diabetes Death Rates

During 1992-2001, age-adjusted death rates for diabetes in the nation and Nebraska have increased for everyone, except for Nebraska Hispanics (2.8 percent decrease). There were no deaths with recorded diabetes as an underlying cause for Asian Americans between 1992-1996 probably because of a younger population among this group (Table 2).

Table 2
Diabetes: Underlying Cause of Death Rates for U.S. and Nebraska
1992-1996 vs. 1997-2001

Category	Age-adjusted Mortality Rates 1992-1996	Age-adjusted Mortality Rates 1997-2001	Rates % Change
U.S.*	22.7	25.2	11.0
Nebraska	16.5	20.1	21.8
White	15.7	18.8	19.8
African American	47.2	61.6	30.5
Native American	63.3	118.4	87.1
Asian	N/A	20.7	0.0
Hispanic	25.1	24.4	-2.8

Age-adjusted to 2000 U.S. Census. Caution: some minority rates may have been based on small numbers. *U.S. rates are for 1994 and 1999 mid point years of Nebraska time period analyzed.
Source: CDC, U.S. Vital Statistics and Nebraska Health and Human Services System, Vital Statistics.

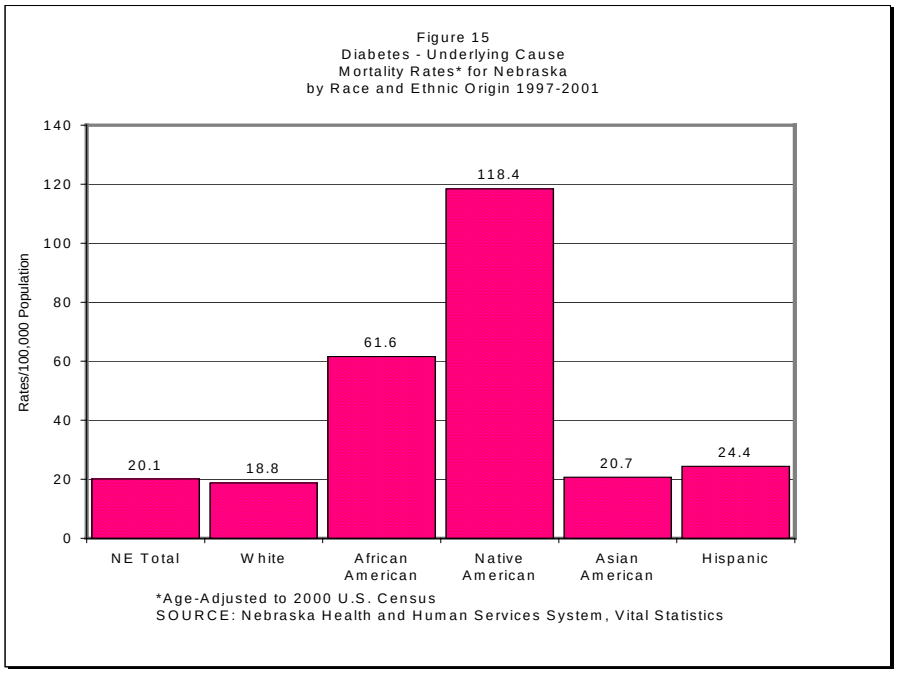
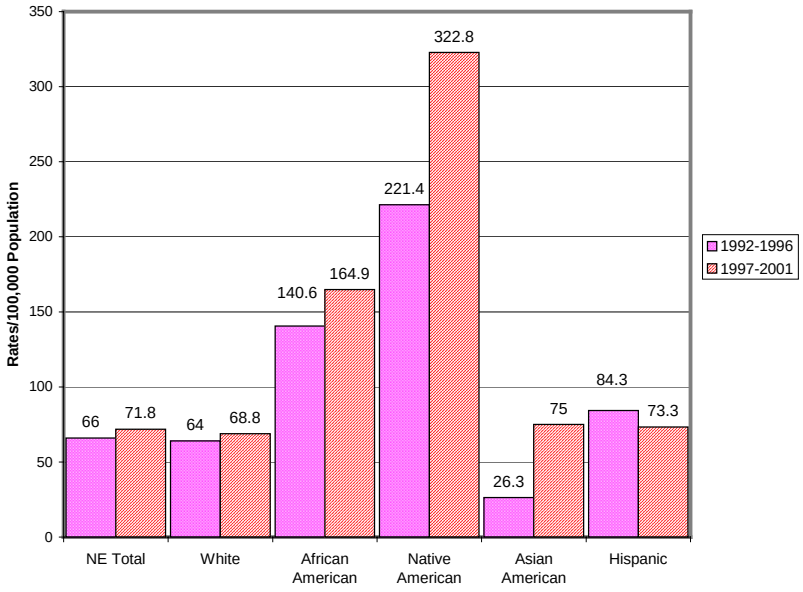


Figure 15 shows the age-adjusted mortality rates of diabetes as the underlying cause of death among Nebraska's racial and ethnic minorities for the five year period, 1997-2001. Similarly, when the rates are compared to the previous five-year period 1992-1996, the diabetes age-adjusted death rates in Nebraska have increased for everyone, except for Nebraska Hispanics. In Nebraska, during 1997-2001, the age-

adjusted death rate with diabetes as an underlying cause among Native Americans was 118.4 and 61.6 for African Americans and for Asian Americans, 20.7 deaths per 100,000 (Figure 15 and Table 2).

Figure 16
Diabetes - Related Mortality Rates*
for Nebraska by Race and Ethnic Origin
1992-1996 vs. 1997-2001



*Age-adjusted to 2000 U.S. Census.
SOURCE: Nebraska Health and Human Services System, Vital Statistics.

Diabetes-Related Causes

A similar trend is observed in diabetes-related deaths. Figure 16 shows that during 1997-2001, Native Americans experienced the highest rate of diabetes-related death (322.8) of any racial and ethnic group in Nebraska when compared to the 1992-1996 rate of 221.4. The relative risk of diabetes-related death for Native Americans was 4.7 times as high as the white rate. African Americans (164.9) experienced an increase in diabetes-related mortality rates while Hispanics recorded a decrease in rates from 84.3 in 1992-1996 to 73.3 per 100,000 population during 1997-2001. Although based on a small number, during 1997-2001 there was a dramatic increase of 185.2 percent in the diabetes related deaths among Asian Americans from 26.3 during 1992-1996 to a high of 75.0 deaths per 100,000 population (Figure 16, Table 3). This dramatic increase in rate may have been due perhaps to a better reporting and coding of ethnicity in the second period 1997-2001, or may have been due to increase in the Asian population etc.

Table 3
Diabetes-Related Causes
Mortality Rates and relative Risk of Mortality
For Nebraska Racial/Ethnic Minority Populations
1992-1996 vs. 1997-2001

Category	1992-1996 Age-Adjusted* Mortality Rate per 100,000 Population	Relative Risk	1997-2001 Age-Adjusted* Mortality Rate per 100,000 Population	Relative Risk	Percentage Rate Change from 1992-2001
		Total		Total	
Diabetes-Related Causes					
White	64.0		68.8	-	7.5
African American	140.6	2.2	164.9	2.4	17.3
Native American	221.4	3.5	322.8	4.7	45.8
Asian American	26.3	0.4	75.0	1.1	185.2
Hispanic	84.3	1.3	73.3	1.1	-13.1

*Age-Adjusted to 2000 U.S. Census
Source: Nebraska Health and Human Services System, Vital Statistics Data, 1992-1996 and 1997-2001.

How does Nebraska compare with the U.S.?

During 1997-2001, Nebraska's rate of 20.1 diabetes-underlying deaths per 100,000 population was slightly lower than the U.S. rate of 25.2 for the same period. While Nebraska experienced the rate of 71.8 diabetes-related deaths per 100,000, between 1997-2001, the U.S. rate for the same period was not available. However, in the period 1980-1996, the U.S. diabetes–related age-adjusted death rate was 64.0 per 100,000 population, according to the CDC [15]. Furthermore, in 2001 "Diabetes rose a striking 6.0 percent among adults in 1999 according to researchers at the Centers for Disease Control and Prevention (CDC).[16]

Diabetes Mortality Rates by Service Areas

Tables 4 and 5 show the age-adjusted mortality rates with diabetes as the underlying cause of deaths according to the Health and Human Service System's service areas for the two 5-year periods of 1992-1996 and 1997-2001. In Table 4, Native Americans living in the Northern (78.9), African Americans in the Southeast (75.2), and Native Americans in the Southwest (69.9) and in the Eastern (54.3) HHSS service areas experienced higher rates of diabetes death rates than both Nebraska (16.5) and whites (15.7) by region.

Table 4
Diabetes – Underlying Cause Mortality Rates*
For Nebraska by Race, Ethnicity and HHSS Service Areas**

	1992-1996						
	NE Total	Western	Southwest	Central	Northern	Southeast	Eastern
NE	16.5	17.2	18.5	15.1	15.0	16.4	17.7
White	15.7	17.0	18.4	15.2	14.3	16.1	15.5
African American	47.2	0.0	0.0	0.0	0.0	75.2	47.1
Native American	63.3	44.6	69.5	0.0	78.9	53.0	54.3
Asian American	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hispanic	25.1	36.0	35.7	15.2	41.3	30.0	14.9

*Rates – Age-adjusted to 2000 U.S. Census
** Data for Table , based on the old and not on the new Western, Central and Eastern HHS Service Areas
SOURCE: Nebraska Health and Human Services System, Vital Statistics

Table 5
Diabetes – Underlying Mortality Rates*
For Nebraska by Race, Ethnicity and HHSS Service Areas**

	1997-2001						
	NE Total	Western	Southwest	Central	Northern	Southeast	Eastern
NE	20.1	22.9	24.2	16.4	17.8	20.4	21.5
White	18.8	22.2	24.3	16.3	16.1	20.3	18.3
African American	61.6	158.6	0.0	41.3	424.9	48.7	61.0
Native American	118.4	62.1	103.4	43.6	181.4	30.9	90.6
Asian American	20.7	38.8	0.0	0.0	20.5	15.8	20.3
Hispanic	24.4	28.8	36.3	20.2	49.3	25.5	16.5

*Rates – Age-adjusted to 2000 U.S. Census
** Data for Table , based on the old and not on the new Western, Central and Eastern HHS Service Areas
SOURCE: Nebraska Health and Human Services System, Vital Statistics

As shown in Table 5, during 1997-2001, minorities in the Northern, Western and Eastern service areas experienced higher diabetes mortality rates as the underlying cause of death than whites (18.8) and the statewide average rates (20.1). Although based on small numbers, African Americans living in the Northern and Western service areas had higher diabetes-underlying mortality rates of 424.9 and 158.6 deaths per 100,000 population respectively. Similarly, Native Americans in Northern (181.4), Southwestern (103.4), Eastern (90.6) and Western (62.1) service areas recorded high diabetes-underlying mortality rates during 1997-2001. In general, racial and ethnic minorities living in the Southern (except for Native Americans (103.4/100,000 population), Central and Southeastern service areas had lower mortality rates and fared better than their counterparts, statewide (Table 5).

Tables 6 and 7 show the age-adjusted mortality rates for diabetes-related deaths according to service areas for the two 5-year periods of 1992-1996 and 1997-2001. Table 6 shows the age-adjusted mortality rates for diabetes-related deaths in Nebraska according to race and service areas from 1992 to 1996. African Americans in the Western (369.6), Southeast (276.1), Eastern (133.5) and central (114.8), and Native Americans living in the Northern (318.3), Southeast (200.8), Western (196.5), and Eastern (134.7)

service areas, and Hispanics in the Western (136.4) and Central (101.9) service areas experienced mortality rates higher than the rates for Nebraska (64.0) and white (64.0 deaths per 100,000 population).

Table 6
Diabetes – Related Mortality Rates*
For Nebraska by Race, Ethnicity and HHSS Service Areas**

	1992-1996						
	NE Total	Western	Southwest	Central	Northern	Southeast	Eastern
NE	64.0	81.4	62.2	61.5	60.6	66.8	68.2
White	64	80.5	62.3	61.6	58.2	65.9	63.1
African American	140.6	369.6	0.0	114.8	0.0	276.1	133.5
Native American	221.4	196.5	69.5	0.0	318.3	200.8	134.7
Asian American	26.3	18.6	0.0	0.0	0.0	0.0	47.0
Hispanic	84.3	136.4	94.8	101.9	41.3	57.1	57.1

*Rates – Age-adjusted to 2000 U.S. Census
** Data for Table , based on the old and not on the new Western, Central and Eastern HHS Service Areas
SOURCE: Nebraska Health and Human Services System, Vital Statistics

Table 7 shows the age-adjusted mortality rates for diabetes-related deaths in Nebraska according to race and service areas from 1997 to 2001. African Americans living in the Northern (672.5), Southeastern (211.2), Eastern (161.0) and Western (158.6) service areas, and Native Americans resident in the Northern (459.1), Eastern (297.2), Southwestern (257.2) and Central (215.4) service areas experienced the highest age-adjusted diabetes-related rates than Nebraska (71.8) and whites (68.8).

Table 7
Diabetes – Related Mortality Rates*
For Nebraska by Race, Ethnicity and HHSS Service Areas**

	1997-2001						
	NE Total	Western	Southwest	Central	Northern	Southeast	Eastern
NE	71.8	74.2	70.0	68.5	66.2	74.1	74.7
White	68.8	72.9	70.0	68.3	62.4	73.1	67.7
African American	164.9	158.6	0.0	82.5	672.5	211.2	161.0
Native American	322.8	167.9	257.2	215.4	459.1	185.1	297.2
Asian American	75.0	96.5	0.0	0.0	20.5	81.8	97.1
Hispanic	73.3	83.3	77.0	59.9	94.4	82.1	63.7

*Rates – Age-adjusted to 2000 U.S. Census and per 100,000 Population
** Data for Table , based on the old and not on the new Western, Central and Eastern HHS Service Areas
SOURCE: Nebraska Health and Human Services System, Vital Statistics

In Table 8, results of this study show that in the three-year period 1998-2000, a total of 5,703 unduplicated Medicaid Enrollees with diabetes in the Nebraska Medicaid Program were minorities (2,989 African Americans, 980 Native Americans, 1,562 Hispanics and 172 Asian/Pacific Islander). Together, minorities who have diabetes accounted for 22.8 percent of the total of 25,064 enrolled in the Medicaid Program.

As Table 8 indicates, the 5,703 racial and ethnic minorities diagnosed with diabetes and enrolled in the Nebraska Medicaid Program, made a total of 52,812 or 23.9 percent of the inpatient/outpatient visits during 1998-2000. The highest number of Medicaid Enrollees with diabetes (29.1 percent) occurred among those 45-64 years of age. Those in both 21-44 and 75-84 years of age each contributed 16.8 percent of the total Nebraska Medicaid enrollment.

Table 8
Unduplicated Number of Medicaid Enrollees with Diabetes as
The Primary Diagnosis for Nebraska by Race, Gender and Age 1998-2000

Category	1998	1999	2000	Total	Percent	Inpatient/Outpatient Visits				
						1998	1999	2000	Total	Percent
Nebraska Total	7,098	8,550	9,416	25,064	100.0	60,955	73,433	86,328	220,717	100.0
Males	2,054	2,455	2,744	7,253	28.9	13,193	20,974	25,052	57,908	26.2
Females	4,991	5,974	6,554	17,519	69.9	47,633	52,076	60,910	160,619	72.8
Unborn	53	121	118	410	1.6	129	383	366	878	0.4
White	5,631	6,336	6,754	18,721	74.7	43,525	55,786	65,296	164,607	74.6
African American	815	1,051	1,123	2,989	11.9	9,669	9,619	11,444	30,732	13.9
Native American	222	363	395	980	3.9	2,361	2,434	2,750	7,545	3.4
Hispanic	325	584	653	1,562	6.2	4,261	4,348	4,634	13,243	6.0
Asian/Pacific Islander	50	67	55	172	0.7	450	460	382	1,292	0.6
Other	55	149	426	630	2.5	689	786	1,822	3,297	1.5
Total Minority	1,412	2,065	2,226	5,703	22.8	16,741	16,861	19,210	52,812	23.9
Age Group										
0	107	177	178	462	1.9	380	485	542	1,407	0.6
1-4	71	91	83	245	0.9	478	519	433	2,837	1.3
5-20	343	421	446	1,210	4.8	2,828	3,646	4,352	10,826	4.9
21-44	1,135	1,377	1,709	4,221	16.8	9,443	13,293	14,496	37,232	16.9
45-64	2,119	2,491	2,678	7,288	29.1	20,134	23,938	28,610	72,682	32.9
65-74	1,456	1,665	1,803	4,924	11.7	11,559	13,236	16,667	41,462	18.8
75-84	1,156	1,439	1,605	4,200	16.8	10,762	11,643	13,773	36,178	16.4
85+	711	889	914	2,514	10.0	5,371	6,673	7,455	19,499	8.8

SOURCE: Nebraska Medicaid Program, 1998-2000

Table 9 shows total Years of Potential Life Lost (YPLL) to diabetes as the underlying cause of death among Nebraska's racial and ethnic minorities. Years of Potential Life Lost (to a disease, condition or cause) as a health indicator is important because it measures premature death. It is calculated using 75 years of potential life as the basis. For instance, infants who die at 6 months have lost 74.5 years of potential life. An adult who dies at the age of 50 years has lost 25 years of life.

Altogether, a total of 2,802 years of potential life, or an average of 280.2 years of potential life annually, were lost due to diabetes-underlying deaths among racial and ethnic minorities in Nebraska over the ten-year period of this study. African Americans lost a total of 934 YPLL at the rate of 379.9 per 100,000 population, while Native American and Hispanics lost 369 and 364 YPLL respectively. However, the age-adjusted YPLL rate was highest among Native American (919.0/100,000 population), and in particular, Native American females (1,006.0/100,000 population). The diabetes YPLL minority-to-white ratio was highest among Native American females (10.2) (Table 9).

Table 9
Years of Potential Life Lost – Diabetes-Underlying Cause
Based on 75 Productive Years of
Life for Nebraska Racial and Ethnic Minority Populations

	1992-1996			1997-2001		
	# of Total YPLL	Age-Adjusted Rate/100,000	Minority-to-White Ratio*	# of Total YPLL	Age-Adjusted Rate/100,000	Minority-to-White Ratio*
Diabetes-Underlying Cause						
Nebraska Total	8,273	107.9		10,801	132.5	
Male	4,186	114.0		6,189	156.3	
Female	4,088	102.		4,612	109.7	
White	7,367	100.2		9,441	121.8	
Male	3,776	106.9		5,496	145.8	
Female	3,591	93.6		3,945	98.9	
African American	624	294.7	2.9	934	379.9	3.1
Male	301	328.3	3.1	518	445.0	3.1
Female	323	264.5	2.8	416	321.4	3.3
Native American	369	667.6	9.2	369	919.0	7.6
Male	109	594.2	5.6	160	787.6	5.4
Female	174	745.2	8.0	209	1,006.0	10.2
Asian American	0	0.0	0.0	58	104.1	0.9
Male	0	0.0	0.0	16	58.9	0.4
Female	0	0.0	0.0	42	134.5	1.4
Hispanic American	184	143.9	1.4	364	176.4	1.5
Male	99	156.5	1.5	218	205.7	1.4
Female	85	129.8	1.4	146	146.6	1.5
Average/YPLL (Minorities)	294.3			431.3		

*Minority Age-Adjusted YPLL Rate/100,000 divided by White Age-Adjusted YPLL Rate/100,000 using 2000 U.S. Census
Source: Nebraska Health and Human Services System, Vital Statistics

Disparities

In the U.S. and Nebraska, diabetes disproportionately affects racial and ethnic minorities.

- Nationally, 2.3 million adult African Americans or 10.8 percent of that population have diabetes.
- African Americans are 1.7 times more likely to have diabetes than whites.
- In Nebraska, 9.9 percent of African Americans had diabetes during 1997-2001.[17]
- 10.6 percent or 1.2 million Mexican Americans have diabetes. Generally, Hispanic Americans are almost two times more likely to have diabetes than whites. More than 4 percent of Nebraska Hispanics were told they have diabetes during 1997-2001.[17]
- During 1997-2001, 9.4 percent of Native Americans had diabetes and were approximately 5 times more likely to die from diabetes than Nebraska whites.[17]
- Nationally, diabetes disproportionately affects Asian Americans and Pacific Islanders. A study of Japanese in Seattle, Washington in 1983-88 estimated that 20 percent of men and 16 percent of women had type 2 diabetes. [14]
- Nationwide, 6.3 million Americans 65 years and older have diabetes. In Nebraska, diabetes disproportionately affected minorities, thus: African Americans (32.3 percent) of those 65-74 years of

  age Native American (21.7 percent) who are 65 to 74 years of age, and Hispanics, 13.8 percent of 65-74 years and older ,[17] (Figure 6). The risk of diabetes increases with age, especially for those minorities 65 years and older.

Diabetes Screening

Diabetes screening is usually done by testing the blood sugar or glucose level to determine the presence or absence of diabetes. According to the American Association of Clinical Endocrinologists, a "blood test determines the level of glucose (sugar) in the blood. Levels outside normal ranges can be an indication of diabetes. A person should be screened if they have one or more of the warning signs or risk factors of diabetes." [9]

According to the Health Fitness Foundation, Inc. warning signs of Type 1 Diabetes Mellitus include:

- Frequent urination (in large quantities)
- Excessive thirst
- Extreme hunger
- Rapid weight loss
- Fatigue (weak and tired)
- Irritability and mood changes
- Neausea and vomiting

- High amounts of sugar in the blood/or urine. These symptoms occur suddenly and must receive immediate medical attention.[18]

Signs and symptoms of Type 2 Diabetes Mellitus include:

- Blurred vision
- Tingling or numbness in the legs, feet or fingers
- Frequent infection of the skin
- Recurring skin, gum or urinary track infections
- Itching of skin and/or genitals
- Drowsiness
- Slow healing of cuts and bruises
- Any of the symptoms listed under Type 1 Diabetes. These symptoms occur gradually, and they are no less important than those under Type 1 Diabetes and must as well receive immediate medical attention, [18] according to the Health Fitness Foundation, Inc.

Barriers to Treating Diabetes

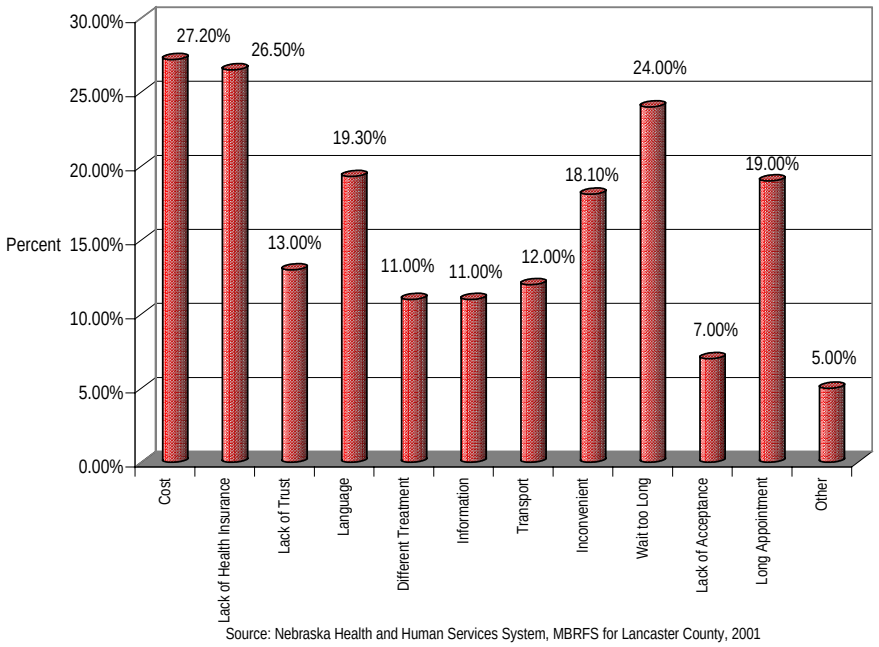
According to the National Diabetes Education Program, several barriers exist to treating diabetes effectively, including the trivialization of type 2 diabetes by health care providers who often tell their patients that they have a "little sugar." Changes in lifestyle and the diabetes daily self-management regimen which patients must undergo can be difficult to maintain. Many patients do not have the awareness, knowledge, the social support, or are not taught the skills they need to successfully self-manage the disease on a daily basis. Furthermore, some physicians may need to learn more about intensive management of diabetes. Health care coverage, economic incentives for the best care as well as enough physician time to devote to care are lacking. "Health care providers have different skill levels… prevention is difficult to sell to payers and policy makers. They often focus on the financial bottom line and don't see the benefits of prevention 10 years down the road."[14]

Further more, among racial and ethnic minorities, barriers to general health care access can arise from various sources including communication, race or ethnicity, cost, transportation, trust etc., which can present a major barrier to obtaining services. Results of the 2001 Minority Behavior Risk Factor Survey (MBRFS) for Lancaster County indicate the following. When respondents were asked whether they "strongly agree," "agree," "disagree," or "strongly disagree" that racial and ethnic origin is a barrier to receiving health care services in their community, 30.2 percent said they agree (or strongly agree); 59.4% said they disagree (or strongly disagree).[11] Again, when asked the question Have you experienced any of the stated problems in getting quality health care in this community during the past year, 27.2 percent and 24.0 percent of the respondents said cost and waiting too long to be seen at the doctor's office are obstacles to obtaining health care [13]
(Figure 17).

Treatment of Diabetes

A clinical research, the *Diabetes Control and Complication Trial* (DCCT) study sponsored by the National Institute of Health (NIH), concluded that "diabetes is controllable." Four years of the DCCT trial study "proved that intensive therapy with the goal of improving blood glucose control significantly reduces the microvascular complications of diabetes that affects the eyes, kidneys, and nerves." [14] The findings of this study, along with other recent studies, demonstrate new ways of controlling diabetes and avoiding complications. The study found that new forms of insulin, new tools for injection, the monitoring of blood glucose levels as well as any sustained effort in lowering the blood sugar level help in controlling diabetes, according to the National Diabetes Education Program.

Figure 17
Health Barriers
Obstacles to Obtaining Health Care
for Lancaster County by Race/Ethnicity 2001



Source: Nebraska Health and Human Services System, MBRFS for Lancaster County, 2001

DISCUSSION

The Impact of Diabetes

In general, "diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications,"[8] according to the CDC. Furthermore, although "African Americans, Hispanics, and Native Americans experience a 50-100 percent higher burden of illness and mortality due to diabetes than white Americans, yet the disease appears to be more poorly managed among minority patients,"[20] according the Institute of Medicine's (IOM) report, *Unequal Treatment*. Disparities still exist "even after controlling for patients' gender, education, age and other access-related factors such as patients' insurance status and income," according to several studies in the IOM's report. [19]

There is currently, no cure for diabetes and the risk factors range from old age, overweight and obesity, high blood pressure, high cholesterol levels, to race/ethnicity and family history, to lack of physical activity. However, several barriers to treating diabetes seem to complicate risks. According to the National Diabetes Education Program, barriers to treatment range from "negative messages (trivialization of type 2 diabetes as a "little sugar") from health care providers to patients, self-management challenges, knowledge/skill gaps, lack of social support, a lack of provider knowledge, and different physician skill levels, to economic constraints and inadequate diabetes coverage." [14]
The good news is that diabetes is controllable. With early screening and diagnosis, intensive therapy, adequate and aggressive self-management, better and newer screening mechanisms and devices, new forms of insulin, and non-painful insulin injecting tools and methods, sustained lower
blood sugar and glucose levels can be maintained and monitored for quality health outcomes. Lifestyle adjustments each person with diabetes can make can contribute to a better health outcome. A major research study, the *Diabetes Control and Complications Trial*, sponsored by the National Institute of Health, found "that intensive therapy with the goal of improving blood glucose control significantly reduces the microvascular complications of diabetes that affect the eyes, kidneys, and nerves, as well as in shedding new light on controlling diabetes and preventing complications." [14]

High diabetes-underlying and related death rates among Nebraska's racial and ethnic minority populations may be indicative of inadequate diabetes self-care and management, and may be related to increased illnesses and complications in these groups. Diabetes is closely associated with increased risk of kidney failure, stroke, amputation, heart disease, birth defects, heart attacks, illnesses, disabilities and premature deaths.

Implications for health service delivery include the fact that for an effective quality diabetes health outcome to be sustained, intensive diabetes educational and awareness programs need to be made more available to individuals with diabetes. Diabetes educators and care providers need to stress the importance of early screening and diagnosis as well as point out to those with diabetes and their families the essence of following self-management regimen in the caring of the disease.

The diabetes self-care and management guidelines developed by the Nebraska Diabetes Control and Prevention Program, largely based on the standards of care recommended by the American Diabetes

Association, are available to persons with diabetes. These guidelines are designed for physicians who test people with diabetes, for use and application when providing services to people with diabetes. Perhaps individualized self-care management, treatment goals, and monitoring of the problems and complications of diabetes are essential procedures in effectively and successfully controlling or delaying diabetes [4].

In general, data from this study indicate that:

- Approximately 80,439 Nebraskans 18 years and older (6.4% of the 2001 population) have been diagnosed with diabetes. In 2001, 9.9 percent of African Americans, and 9.4 percent of Native Americans were diagnosed with diabetes at rates higher than that of Nebraska and the nation.

- Fewer Hispanics with diabetes (62.3 percent) reported going for routine check in the past year than all of Hispanics (67.8 percent). Furthermore, compared to other minorities in Nebraska, slightly over one-half (51.2 percent) of Hispanics with diabetes did not engage in any physical activity in the past year. Over three-fourths of adult Hispanics (82.2 percent) who have diabetes, are obese (Figures 12 and 13).

- Diabetes disproportionately affects Nebraska racial and ethnic minorities especially those in the age category of 65-74 years of age. Thus the risk of diabetes and complication increases with age and being a minority.

- Of the four major racial and ethnic minority groups, diabetes disproportionately affects Native Americans in what may be epidemic proportions.

During the ten-year period, 1992-2001, a total of 12,475 diabetes-related deaths and 3,278 diabetes-underlying cause of deaths occurred in Nebraska. Native American females, African Americans and Hispanic males in age categories of 45-64 and 65-74 years had higher prevalence of diabetes than both Nebraska and the nation. However, in the U.S., minorities of both genders in the age category of 75 years and older seemed worse off than whites and their counterparts in Nebraska.

In the 10-year study 1992-2001, the results indicate that compared to whites in Nebraska, minorities have higher prevalence of the risk factors of diabetes. Although the rates of high blood pressure, cholesterol level, smoking, overweight/obesity, and lack of physical activity, were higher among minorities, than among whites, 37 percent of Native Americans with diabetes do not have any insurance (Figures 9, 10,11, 12, 13 and 14).
More than any other racial and ethnic minorities in Nebraska, Native Americans recorded the highest age-adjusted diabetes-underlying cause mortality rates as well as for diabetes-related mortality rates. In the period 1997-2001, Native Americans were 4.7 times more likely and African Americans were 2.4 times more likely than whites to die from diabetes related causes.

The mortality rates for diabetes as the underlying cause of death for Native Americans and African Americans were 118.4 and 61.6 in 1997-2001 respectively (Table 2). These rates increased by more than 87 and 30 percent from the 1992-1996 rate respectively. These rates did not meet the Nebraska Healthy People 2010 objectives. For Hispanics, the mortality rate decreased slightly (-2.8 percent) to 24.4 deaths per 100,000 population in 1997-2001, compared to 25.1 in 1992-1996.

This study found that during 1997-2001, Asian Americans (20.7) and Hispanics (24.4) met the Nebraska 2010 objective for diabetes underlying-cause mortality rates of no more than 25 per 100,000 population. Native Americans (118.4) and African Americans (61.6) have yet to meet the Nebraska 2010 objective for diabetes mortality rates (Table 2). Conversely, this study found that when deaths had diabetes reported as a conrtibuting or multiple (related) cause of death is reviewed, no racial and ethnic minority group met the Nebraska 2010 objective for diabetes mortality rates. To meet the 2010 objective of no more than 25 deaths per 100,000 population) for African Americans, Native Americans, Asian Americans and Hispanics, a further reduction in their rates by 6.6, 12.9, 3.0, and 2.9 times respectively, would be needed (Table 3).

Altogether, of 25,064 Nebraskans who have diabetes and are enrolled in the Medicaid Program in the period 1998-2000, minorities accounted for 22.8 percent or a total of 5,703 enrollees. The prevalence of Nebraskans with diabetes and enrolled in the Medicaid Program was highest among those in the age category of 45-64 years (Table 8).

During the two 5-year periods 1992-1996 and 1997-2001, a total of 2,802 years of potential life or an average of 280.2 years annually, were lost due to diabetes as an underlying cause of deaths among Nebraska's racial and ethnic minorities. During 1997-2001 the age-adjusted diabetes YPLL rate for Native Americans (919.0/100,000 population) was higher than the rate for whites (121.8/100,000 population) (Table 9).

Current Nebraska and National Diabetes Control Programs:

What is the Nebraska Health and Human Services System doing to Affect this Health Indicator?

At the state level, the Nebraska Health and Human Services System's "Diabetes Control and Prevention Program (NDCP) works to reduce or prevent complications and premature death for Nebraskans with diabetes. The NDCP strives to educate persons with diabetes, their families, and health professionals. One primary function of the NDCP is to update information and training materials to ensure application of current knowledge and treatment of diabetes."[4] Activities include "completing and publishing *the Nebraska State Diabetes Plan,* conducting surveillance activities and providing technical assistance to community groups, health professionals, organizations, and others who may be planning diabetes programs or activities." [4]

At the national level, the Centers for Disease Control and Prevention (CDC) and the National Institute of Diabetes and Digestive Kidney Disease (NIDDK) are sponsoring the National Diabetes Education Program. "The NDEP is an initiative that involves public and private partners to improve the treatment and outcomes for people with diabetes to promote early diagnosis, and ultimately the onset of diabetes."[4] Nebraska is an active participant in the National Diabetes Education Program's (NDEP) activities.

Furthermore, the Nebraska Minority Health Initiative Grants funded by LB 692 have been able to address diabetes educational awareness in several projects and clinics across the state.

While efforts are being made at both local and national levels to arrest the impacts and problems of diabetes, it is important to note that reduction of health disparities is a shared responsibility requiring

individual ownership and accountability as well as institutional involvement. With relevant research, collaborating with health care providers, federal, state, and local governments, businesses, schools, universities, advocacy groups, community leaders, faith-based organizations, and each individual in diabetes intervention efforts to ensure proper education and awareness, self-care and management, will greatly enhance the identification of the causes of these disparities. An overall evaluation of existing programs and the development of newer and better intervention strategies might be needed to ensure more effective outcomes in the way health messages are communicated, delivered, and implemented in the communities.

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